Claims:

1. A method for encoding a digital image, in which method the digital image is divided into blocks (C, L, U, UL, UR), **characterized** in that in the method a spatial prediction for a block (C) is performed to reduce the amount of information to be transmitted, wherein at least one prediction method (P1—P13) is defined, a classification is determined for at least one neighbouring block (L, U) of said block (C) to be predicted according to the contents of said neighbouring block (L, U), and a prediction method (P1—P13) is selected for the current block (C) on the basis of at least one said classification.

2. A method according to Claim 1, **characterized** in that the classification is determined on the basis of directionality information of the block.

3. A method according to Claim 2, **characterized** in that the directionality information of the block is determined by calculating at least one gradient value (g_k) on the basis of pixel values of said block.

4. A method according to Claim 3, **characterized** in that the gradient values (g_k) are calculated with the following formula

$$g_0 = \frac{1}{N(N-1)} \max\left(1, \sum_{y=0}^{N-1}\sum_{x=0}^{N-2}\left|I(x,y) - I(x+1,y)\right|\right)$$

$$g_1 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=1}^{N-1}\left|I(x,y) - \tfrac{1}{2}\left(I(x-1,y) + I(x-1,y+1)\right)\right|\right)$$

$$g_2 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=1}^{N-1}\left|I(x,y) - I(x-1,y+1)\right|\right)$$

$$g_3 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=1}^{N-1}\left|I(x,y) - \tfrac{1}{2}\left(I(x-1,y+1) + I(x,y+1)\right)\right|\right)$$

$$g_4 = \frac{1}{N(N-1)} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=0}^{N-1}\left|I(x,y) - I(x,y+1)\right|\right)$$

$$g_5 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=0}^{N-2}\left|I(x,y) - \tfrac{1}{2}\left(I(x,y+1) + I(x+1,y+1)\right)\right|\right)$$

$$g_6 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=0}^{N-2}\left|I(x,y) - I(x+1,y+1)\right|\right)$$

$$g_7 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=0}^{N-2}\left|I(x,y) - \tfrac{1}{2}\left(I(x+1,y) + I(x+1,y+1)\right)\right|\right) \quad (1)$$

where N is the size of the block, I(x,y) represent the pixel intensity values, indices x and y refer to coordinates of pixel inside the block, and k represents edge orientations.

5. A method according to Claim 4, **characterized** in that at least eight directionality classes (D0 – D7) are defined for different edge orientations.

6. A method according to Claim 1, **characterized** in that the classification comprises further 3 non-directional classes (D8 – D10) corresponding to flat, smooth texture and coarse texture blocks.

7. A method according to Claim 1, **characterized** in that in the method at least two context classes (C0 – C6) are defined, therein a mapping phase is performed, in which the classification information (D8 – D10) is mapped into one of said context classes (C0 – C6).

8. A method according to Claim 1, **characterized** in that in the method a classification is determined for two neighbouring blocks (L, U) of said block (C) to be predicted according to the contents of said neighbouring blocks (L, U), context classes (C0 – C6) are defined for said neighbouring blocks (L, U), and a prediction method (P1—P13) is selected for the current block (C) on the basis of a combination of the defined context classes (C0 – C6).

9. A method according to the Claim 1, **characterized** in that in the method a cost function is defined, wherein the selection of the prediction method comprises the steps of:

- calclulating a value of the cost function for at least two prediction methods,
- exploring the calculated cost function values to finding the minimum value, and
- selecting the prediction method which produces said minimum value for the cost function.

10. A method according to Claim 9, **characterized** in that the cost function is defined as

$$Cx = D + \lambda R,$$

where cost Cx is defined as a weighted sum of distortion D and rate R associated with each of the prediction methods and λ is the weighting factor.

11. A method according to Claim 1, **characterized** in that in the method a prediction error is defined on the basis of the predicted block and the real pixel values of said block (C), and that the prediction error information is coded, and the coded prediction error information is transmitted.

12. A device for encoding a digital image, which is divided into blocks (C, L, U, UL, UR), **characterized** in that the device comprises means for performing spatial prediction for a block (C) to reduce the amount of information to be transmitted, wherein at least one prediction method

(P1—P13) has been defined, that the device further comprises means for determining a classification for at least one neighbouring block (L, U) of said block (C) to be predicted according to the contents of said neighbouring block (L, U), and means for selecting a prediction method (P1—P13) for the current block (C) on the basis of at least one said classification.

13. A device according to Claim 12, **characterized** in that the means for determining classification comprises means for determining directionality information of the block.

14. A device according to Claim 13, **characterized** in that the means for determining directionality information comprises means for calculating at lest one gradient value (g_k) on the basis of pixel values of said block.

15. A device according to Claim 14, **characterized** in that the gradient values (g_k) have been calculated with the following formula

$$g_0 = \frac{1}{N(N-1)} \max\left(1, \sum_{y=0}^{N-1}\sum_{x=0}^{N-2}\left|I(x,y) - I(x+1,y)\right|\right)$$

$$g_1 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=1}^{N-1}\left|I(x,y) - \tfrac{1}{2}\left(I(x-1,y) + I(x-1,y+1)\right)\right|\right)$$

$$g_2 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=1}^{N-1}\left|I(x,y) - I(x-1,y+1)\right|\right)$$

$$g_3 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=1}^{N-1}\left|I(x,y) - \tfrac{1}{2}\left(I(x-1,y+1) + I(x,y+1)\right)\right|\right)$$

$$g_4 = \frac{1}{N(N-1)} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=0}^{N-1}\left|I(x,y) - I(x,y+1)\right|\right)$$

$$g_5 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=0}^{N-2}\left|I(x,y) - \tfrac{1}{2}\left(I(x,y+1) + I(x+1,y+1)\right)\right|\right)$$

$$g_6 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=0}^{N-2}\left|I(x,y) - I(x+1,y+1)\right|\right)$$

$$g_7 = \frac{1}{(N-1)^2} \max\left(1, \sum_{y=0}^{N-2}\sum_{x=0}^{N-2}\left|I(x,y) - \tfrac{1}{2}\left(I(x+1,y) + I(x+1,y+1)\right)\right|\right) \quad (1)$$

where N is the size of the block, I(x,y) represent the pixel intensity values, indices x and y refer to coordinates of pixel inside the block, and k represents edge orientations.

16. A device according to Claim 15, **characterized** in that at least eight directionality classes (D0 – D7) have been defined for different edge orientations.

17. A device according to Claim 12, **characterized** in that the classification comprises further 3 non-directional classes (D8 – D10) corresponding to flat, smooth texture and coarse texture blocks.

18. A device according to Claim 12, **characterized** in that at least two context classes (C0 – C6) have been defined, therein the device comprises means for performing a mapping phase, in which the classification information (D8 – D10) is arranged to be mapped into one of said context classes (C0 – C6).

19. A device according to Claim 12, **characterized** in that the device comprises means for performing classification for two neighbouring blocks (L, U) of said block (C) to be predicted according to the contents of said neighbouring blocks (L, U), means for defining context classes (C0 – C6) for said neighbouring blocks (L, U), and means for selecting a prediction method (P1—P13) for the current block (C) on the basis of a combination of the defined context classes (C0 – C6).

20. A device according to Claim 12, **characterized** in that a cost function has been defined, wherein means for selecting a prediction method (P1—P13) comprises means for:

- calclulating a value of the cost function for at least two prediction methods,
- exploring the calculated cost function values to finding the minimum value, and
- selecting the prediction method which produces said minimum value for the cost function.

21. A method according to Claim 20, **characterized** in that the cost function has been defined as

$$Cx = D + \lambda R,$$

where cost Cx has been defined as a weighted sum of distortion D and rate R associated with each of the prediction methods and λ is the weighting factor.

22. A device according to Claim 12, **characterized** in that the device comprises means for defining a prediction error on the basis of the predicted block and the real pixel values of said block (C), means for coding the prediction error information, and means for transmitting the coded prediction error information.

23. An encoder (1) comprising means for encoding a digital image , and means for dividing the digital image into blocks (C, L, U, UL, UR), **characterized** in that the encoder (1) comprises means for performing spatial prediction for a block (C) to reduce the amount of information to

be transmitted, wherein at least one prediction method (P1—P13) has been defined, that the encoder (1) further comprises means for determining a classification for at least one neighbouring block (L, U) of said block (C) to be predicted according to the contents of said neighbouring block (L, U), and means for selecting a prediction method (P1—P13) for the current block (C) on the basis of at least one said classification.

24. A decoder (10) comprising means for decoding a digital image, which is divided into blocks (C, L, U, UL, UR), **characterized** in that the decoder (10) comprises means for performing spatial prediction for a block (C) to reduce the amount of information to be transmitted, wherein at least one prediction method (P1—P13) has been defined, that the decoder (10) further comprises means for determining a classification for at least one neighbouring block (L, U) of said block (C) to be predicted according to the contents of said neighbouring block (L, U), and means for selecting a prediction method (P1—P13) for the current block (C) on the basis of at least one said classification.

25. A codec (1, 10) comprising means for encoding a digital image, means for dividing the digital image into blocks (C, L, U, UL, UR), and means for decoding a digital image, **characterized** in that the codec (1, 10) comprises means for performing spatial prediction for a block (C) to reduce the amount of information to be transmitted, wherein at least one prediction method (P1—P13) has been defined, that the codec (1, 10) further comprises means for determining a classification for at least one neighbouring block (L, U) of said block (C) to be predicted according to the contents of said neighbouring block (L, U), and means for selecting a prediction method (P1—P13) for the current block (C) on the basis of at least one said classification.

26. A mobile terminal (24) comprising means for encoding a digital image, means for dividing the digital image into blocks (C, L, U, UL, UR), and means for decoding a digital image, **characterized** in that the mobile terminal (24) comprises means for performing spatial prediction for a block (C) to reduce the amount of information to be transmitted, wherein at least one prediction method (P1—P13) has been defined, that the mobile terminal (24) further comprises means for determining a classification for at least one neighbouring block (L, U) of said block (C)

to be predicted according to the contents of said neighbouring block (L, U), and means for selecting a prediction method (P1—P13) for the current block (C) on the basis of at least one said classification.

27. A storage medium for storing a software program comprising machine executable steps for encoding a digital image, and for dividing the digital image into blocks (C, L, U, UL, UR), **characterized** in that the software program further comprises machine executable steps for performing spatial prediction for a block (C) to reduce the amount of information to be transmitted, wherein at least one prediction method (P1—P13) has been defined, steps for determining a classification for at least one neighbouring block (L, U) of said block (C) to be predicted according to the contents of said neighbouring block (L, U), and steps for selecting a prediction method (P1—P13) for the current block (C) on the basis of at least one said classification.